To: Paul Kowalski
Director – Environmental Health
New Haven Health Department
54 Meadow Street
New Haven, CT 06519

From: Gerald Valentine
78 West Helen Street
Hamden, CT 06514
(203) 499-7474

RE: Public Nuisance: Combined Sewer Overflows into Public Spaces within New Haven

October 20, 2013

Dear Director Kowalski,

As you are probably aware, downtown New Haven has a serious flooding problem. You may be less aware that this problem includes the recurrent entry of Combined Sewer Overflows (CSOs) into public parking garages located in the Route 34 corridor. I am writing to you because I believe the existence of these CSOs are a clear and present public nuisance within your jurisdiction. The nature of the nuisance is the discharge of sewage into public spaces in such a way that transmission of infective material may result thereby.

The primary evidence to support the existence of these problematic CSOs is derived from a report that was commisioned by the City of New Haven (CNH) to analyze the causes of frequent flooding at Union Ave, Route 34 and Temple Street. This report, entitled '***Drainage Study for Route 34 and Union Avenue'***, was prepared by Cardinal Engineering Associates and submitted to the CNH on July 11, 2012 (Fig.1). A digital copy of the report is available upon request.

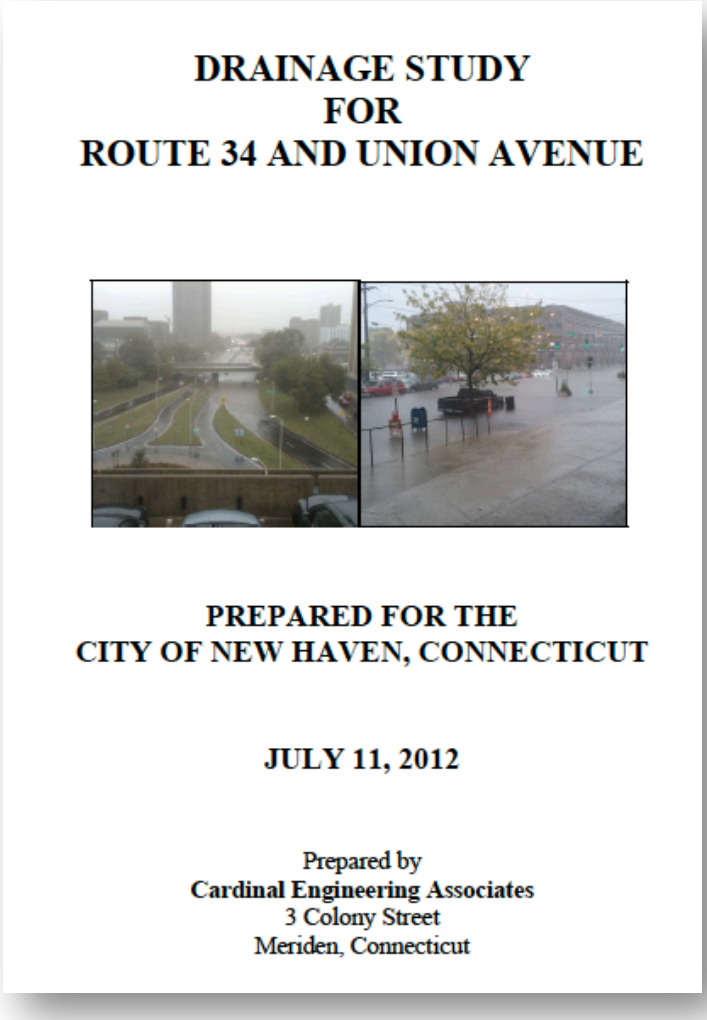


Fig. 1. *Cover page of the Cardinal Enginnering Associates Report.*

The two images on the cover were taken on October 1, 2010.

The image on the left shows a flooded Rt. 34 Connector under the College St. bridge as seen from an upper level of the Air Rghts Garage.

The image on the right depicts Union Avenue flooding.

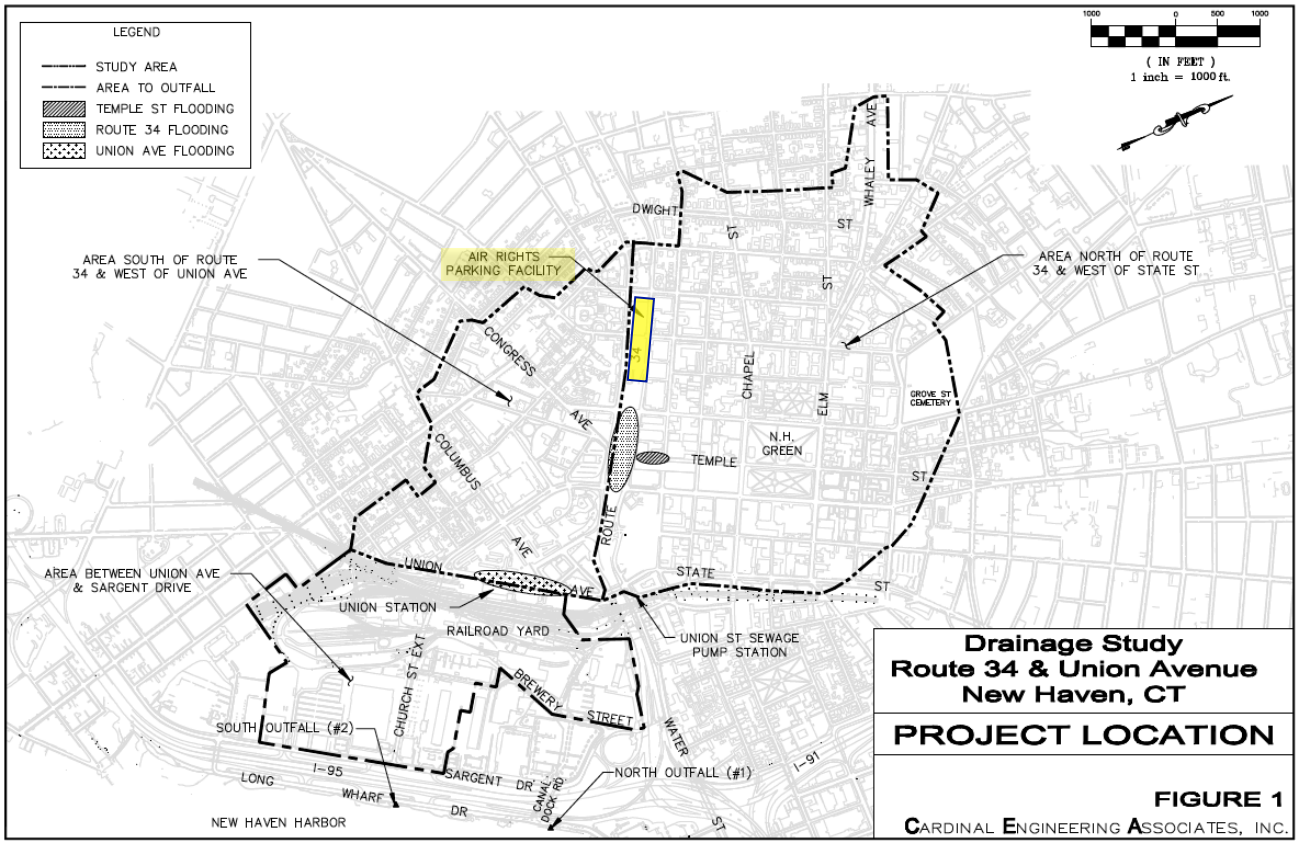


Fig. 2. *The yellow box designates the location of the Air Rights Garage relative to the areas of recurrent flooding that were analyzed in the Cardinal drainage study.*

The study area of the Cardinal report includes a drainage basin of 580 acres in downtown New Haven and includes Yale New Haven Hospital (YNHH), Smilow Cancer Hospital (SCH), the Temple St. Garage, the Union Avenue Garage, and the Air Rights Garage (ARG). As seen in Fig. 2 above, the ARG is just upstream of the area designated ROUTE 34 FLOODING. The flooding that occurs in the areas designated as TEMPLE ST FLOODING and UNION AVE FLOODING in Fig. 2 include two parking garages (Temple St & Union Ave) that are operated by the New Haven Parking Authority (NHPA). What is conspicuolusly absent from the Cardinal report is an account of the recurrent flooding that also occurs in an additional parking space operated by the NHPA, the Under Air Rights Garage (UARG, Fig. 3). The UARG is located in a partially enclosed space beneath the ARG upon land that has 2 primary functions:

1. It serves as a loading dock for Yale New Haven Hospital (YNHH) / Smilow Cancer Hospital (SCH) at 55 Park Street; and

2. It serves as a ***'surface parking lot'*** that is operated by the New Haven Parking Authority (NHPA). Since 2010, the UARG has been used by the Connecticut Mental Health Center (CMHC) as a parking lot for its staff and visitors. This is in accordance with a license agreement between the NHPA and CMHC.

Fig. 3. *Image of the UARG 'surface parking lot' looking west toward the YNHH loading dock. This image was taken on August 11, 2012.*

In this letter, I will focus on flooding in the vicinity of the UARG because my family was directly impacted by UARG flooding on August 10, 2012. Not only did the flood result in property damage to our car (and at least 30 others as well), my hands were inflamed for several days after removing the mixed raw sewage / storm water from our minivan (a photo of my hands demostrating this inflammation is available upon request). As I will try to make clear in this letter, the findings from the Cardinal drainage analysis directly supports the contention that on August 10, 2012, the flood water that inundated the expansive space underneath the garage included a CSO from the proper functioning of a nearby 'regulator'. Furthermore, given the current configuration of the hospital district's sewershed, the UARG, and hospital's loading dock area, remain at risk from future CSOs as do other parking garages operated by the NHPA. Please note that Cardinal's lead engineer for the drainage study declined my request to enter into a consultation agreement that would extend their analysis to this additional CSO location within the flood-prone Route 34 corridor.

The UARG presently operates on land that was originally intended to be a portion of State Highway 34. Because the highway was designed to pass underneath the 'Air Rights' Garage, the UARG is situated in a deep cut of land that drops well below adjacent grades as one moves west from the eastern Entrance / Exit (Fig. 4).

Fig. 4. *Air Rights Garage and the UARG Entrance / Exit at the eastern boundary of the ARG. Photo taken in August, 2012.*

Fig. 5. *Aerial view of the ARG and its relationship to YNHH and Smilow Cancer Hospital.*

In 2003, after plans to complete the Route 34 expressway were abandonded, the parcels of land under the ARG were transferred from the State of Connecticut to the CNH. In 2008, part of the land beneath the ARG was repurposed as a loading dock serving YNHH/SCH, and in 2010, the NHPA entered into a license agreement with the Connecticut Mental Health Center (CMHC) for use of 202 parking spaces on the UARG 'surface parking lot' located within the ARG.

On October 1, 2010, approximately 5 months after CMHC employees began to park in the UARG, it flooded (coincident with the ROUTE 34 FLOODING that is depicted in Fig. 2 and described in detail in the Cardinal report). Because it occurred at high tide in Long Island sound, this ***1-year storm*** event was sufficient to cause widespread flooding. To the best of my knowledge, only one car was damaged in the UARG because the flooding occurred just before the start of the workday, and approaching cars were redirected. No images from this event are currently available, but there are many eye-witnesses of the event who still work at CMHC.

Then, on August 10, 2012, over 30 vehicles, most of which were owned by employees of CMHC, were damaged when a combination of untreated sewage and stormwater entered into the UARG (see Fig. 6 & 7a,b). All insurance claims were denied by the NHPA's insurance carrier, Travelers, because they found that the flood was not the result of any pre-exisiting defect within the UARG, and that the UARG drainage system was functioning normally. While the rainfall that afternoon was extreme, just short of meeting criteria for a ***100-year storm,*** the NHPA should have known about, with reasonable care, the flood risk in the UARG with *any sustained rainfall event* because it previously flooded during a ***1-year storm***. Furthermore, several drainage analyses that described the inadequacy of the drainshed serving the hospital district were available to the CNH, and the NHPA, prior to the flooding of August 10, 2012.

Fig 6. *Stills from a video clip taken on August 10, 2012 of backflow near the entrance ramp to the roundabout located just east of the UARG. The effluent at this location flows to the lower ground within the enclosed UARG space.*

Fig. 7a. *Interior of UARG with floodwater, looking east toward exit (August 10, 2012).*

Fig 7b. *Turbid floodwater in the UARG (August 10, 2012).*

The UARG again flooded on September 28, 2012 during an intermediate intensity, afternoon rainstorm (Fig. 8a,b).

Fig. 8a. A still from a video showing backflow through a catch basin in the UARG on September 28, 2012.

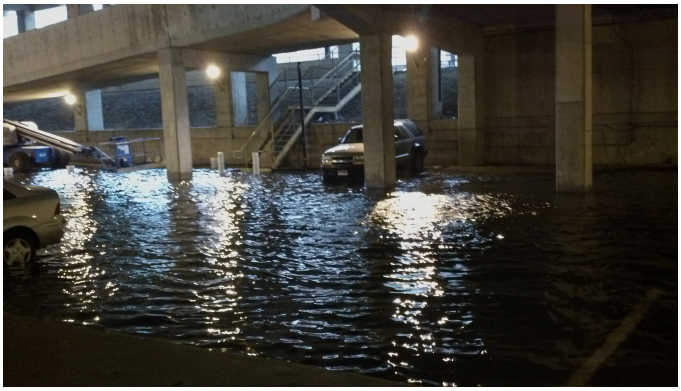
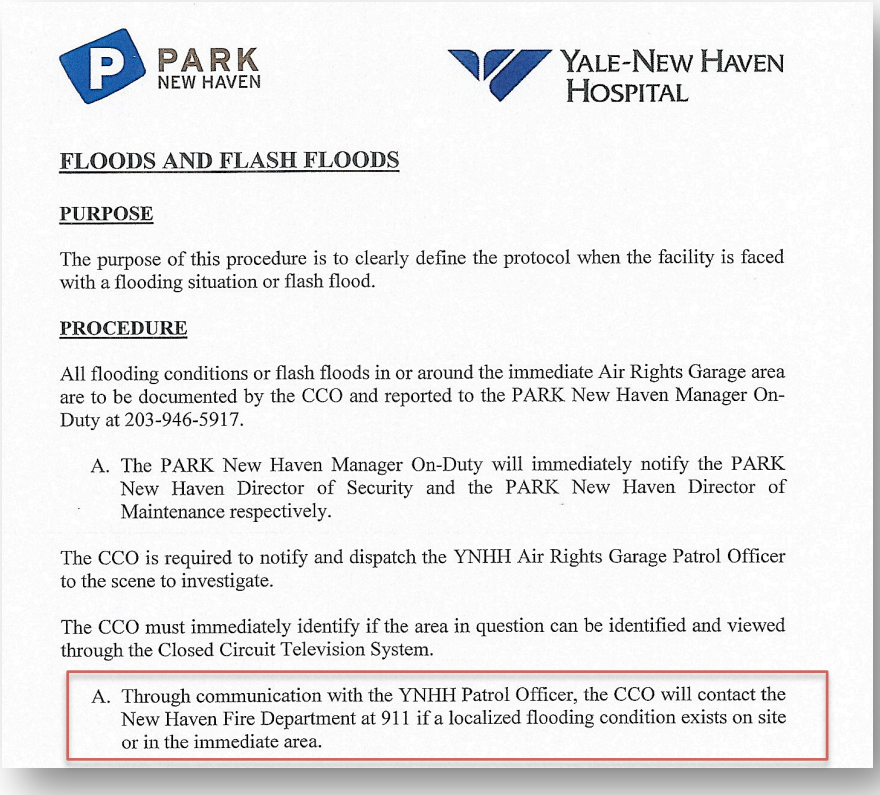


Fig 8b. Note the transparent nature of the flood water. A CSO may not have contributed to this flood event in the UARG.

It is likely that the UARG has flooded on other occasions as well, but these events are not likely to be well documented. For example, the NHPA has a history of deliberately misrepresenting the truth about previous flooding in the UARG and for failing to report flooding events to other departments and agencies. For example, the Greater New Haven Water Pollution Control Authority (GNHWPCA) claims they were never informed about the flooding event in the UARG on August 10, 2012. In addition, the NHPA / Park New Haven does not follow its own emergency protocol that clearly specifies the New Haven Fire Department (NHFD) will be contacted '…if a localized flooding condition exists on site or in the immediate area.' Neither the NHFD, nor the emergency call log maintained under the Director of Public Safety Communications in New Haven have any documentation of flooding during the past 3 years, into the UARG or other garages operated by the NHPA. As the photos above document, and the Cardinal report describes in detail, the flooding into these garages are large events that clearly constitute 'a localized flooding condition'.



PARK NEW HAVEN

YALE-NEW HAVEN HOSPITAL

FLOODS AND FLASH FLOODS

PURPOSE

The purpose of this procedure is to clearly define the protocol when the facility is faced with a flooding situation or flash flood.

PROCEDURE

All flooding conditions or flash floods in or around the immediate Air Rights Garage area are to be documented by the CCO and reported to the PARK New Haven Manager On-Duty at 203-946-5917.

A. The PARK New Haven Manager On-Duty will immediately notify the PARK New Haven Director of Security and the PARK New Haven Director of Maintenance respectively.

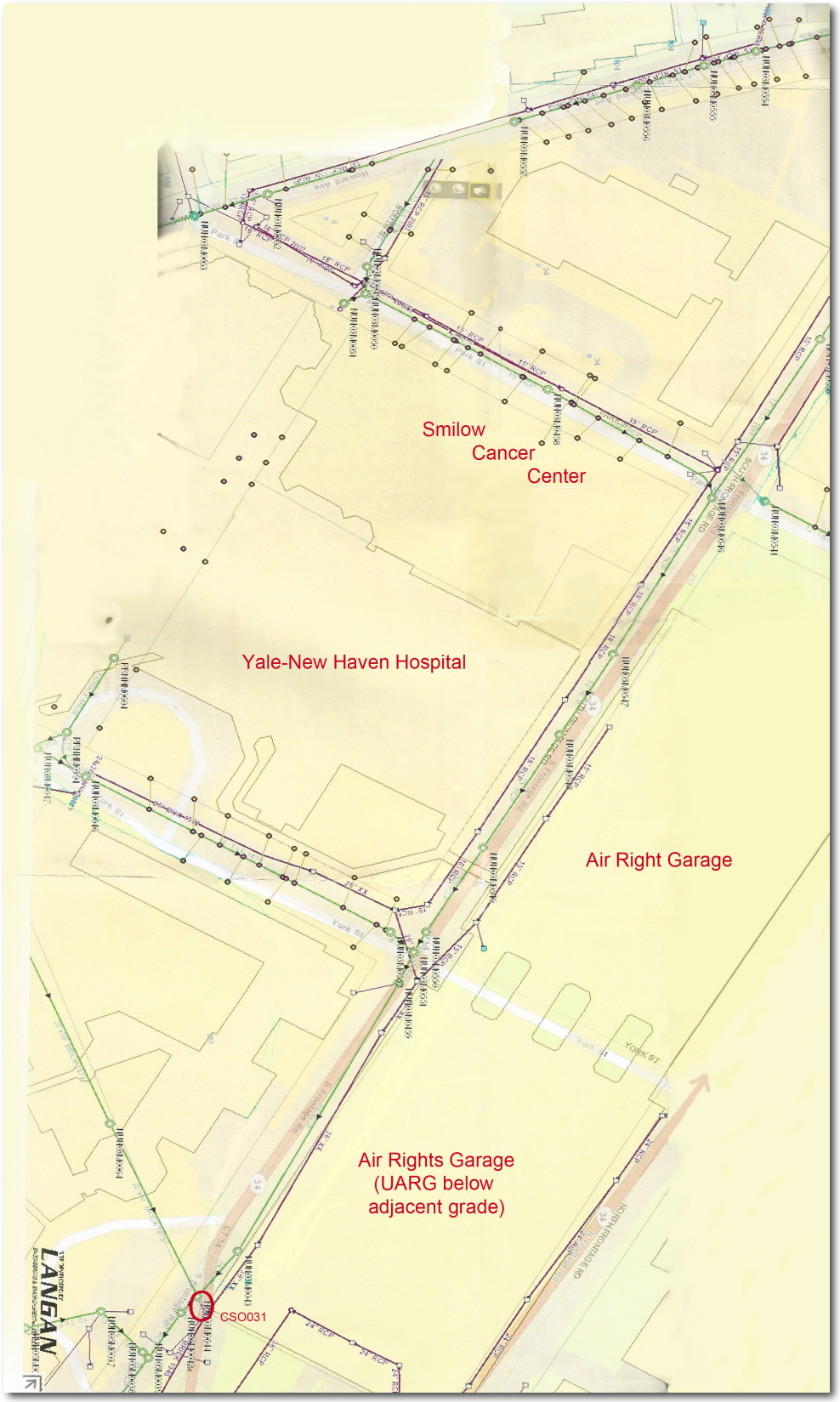
The CCO is required to notify and dispatch the YNHH Air Rights Garage Patrol Officer to the scene to investigate.

The CCO must immediately identify if the area in question can be identified and viewed through the Closed Circuit Television System.

A. Through communication with the YNHH Patrol Officer, the CCO will contact the New Haven Fire Department at 911 if a localized flooding condition exists on site or in the immediate area.

Fig. 9. *A cropped section of Page 9 taken from the Air Rights Garage Emergency Communication and Action Plan.*

Of even greater concern is the possibility that the untreated human sewage that entered into the UARG / YNHH loading dock on August 10, 2012 orginated, in part, from both YNHH and Smilow Cancer Center.



As seen in Fig. 10, the area adjacent to the UARG is served by an old combined sewer (green lines) that serves as the sanitary sewer for the area, including YNHH and SCH, and by a newer separate storm sewer system (purple lines). Please note the red circle in the lower left corner designating CSO 031. This piece of infra-structure is key to understanding why the area around the UARG remains at risk from flooding with untreated sanitary waste from the hospitals.

Fig. 10. *Storm and Sanitary Sewer Map, ARG and YNHH area incl. CSO 031; merged and annotated printouts; originals provided by GNHWPCA in July 2013; Source: http://giswebviewer.gnhwpca.com/gnhwpca_CMOM/index.html (restricted access).*

I first became aware of CSO 031 after visiting the website for the Connecticut Department of Energy and Environmental Protection (DEEP) where a CSO outfall is identified in the vicinity of the southeast corner of the ARG (Fig. 11). In addition, CSO 034, a structure that was 'field verfied' as part of the research for the Cardinal report, is shown just east of CSO 031.

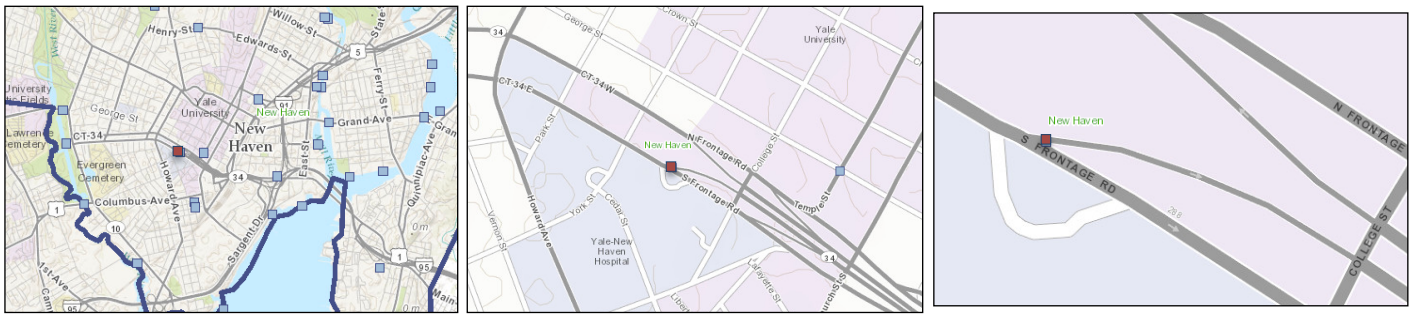


Fig. 11. *The red square designates the location of CSO 031. Please note that this square was changed to red for this report to distinguish it from the other outfalls on the DEEP website. CSO 034 is designated by a blue square to the right of CSO 031 in the left and center frames.*

As depicted in Fig. 12 below, the region around the UARG is characterized by the GNHWPCA as having partial CSO separation status. But according to the Cardinal report (page 6), the majority of roof leaders from buildings in the Route 34 sewershed are still connected to the combined system, and not the upgraded storm sewer. This arrangement promotes CSOs during heavy rain events, or even light events if they occur at high tide. For CSO 031 and 034, their discharge spills onto roadways, and also enters into the UARG and the Temple Street Garage.

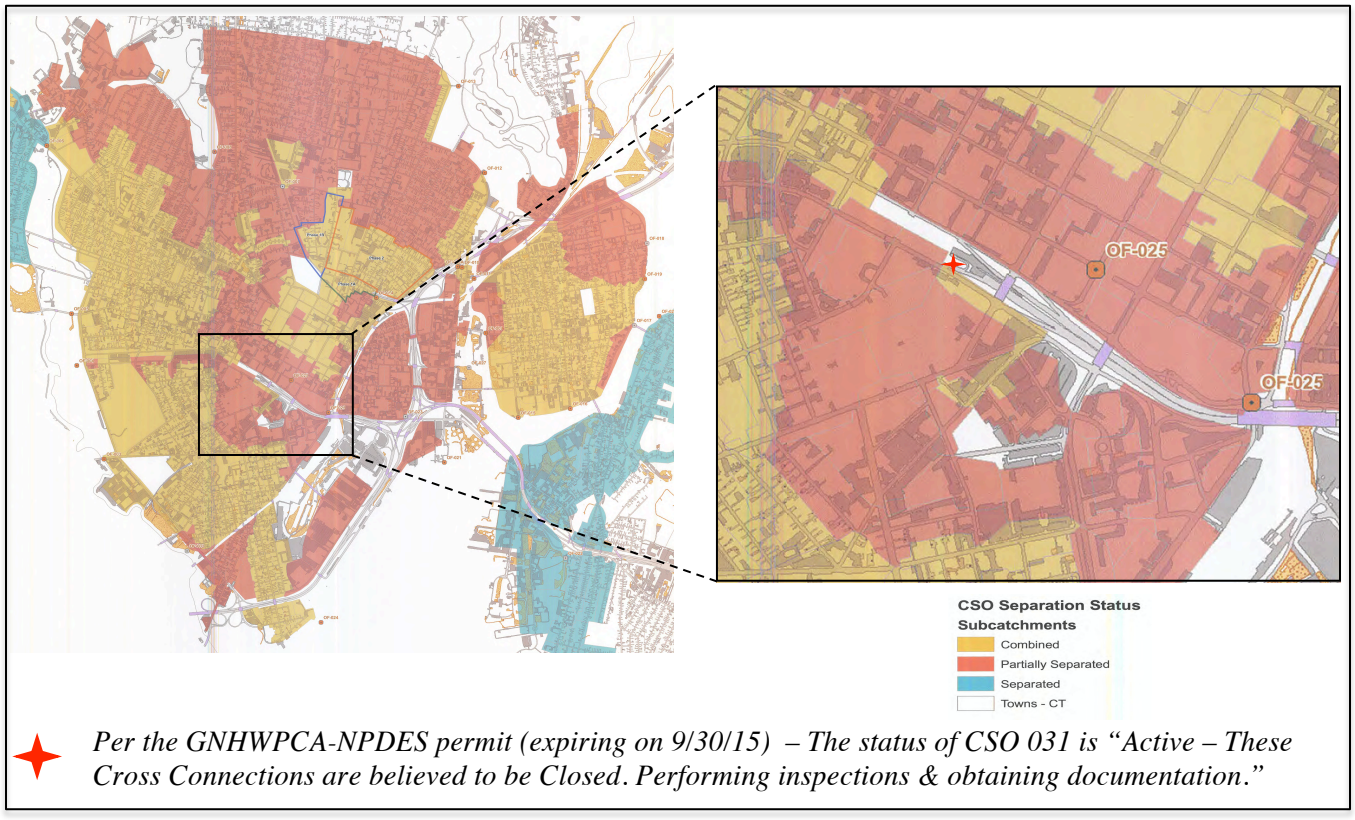


Fig. 12. *Note that a red cross was added to the map in this report to depict the location of CSO 031 which is not otherwise identified.* Image Source: http://www.gnhwpca.com/Userfiles/EJPPP_Final_Report/121017_EJPPP_Final_Report_Web_Vol_2.pdf

During a meeting with an engineer at the GNHWPCA in July 2013, I was informed that CSO 031 and CSO 034 will be renamed as 'Regulators 031 / 034' because they are technically speaking, not CSO outfalls. Please note that although the cross connection at CSO 031 persists on a GNHWPCA map provided to me in July 2013 (Fig. 11), it was recently listed as 'Closed' on the annual status report that was prepared by the GNHWPCA and sent to DEEP to update progress on the New Haven CSO Long Term Control Plan (Fig. 13).

GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY
CSO LONG TERM CONTROL PLAN ANNUAL STATUS REPORT
June 30, 2013

2007 MODEL UPDATE				2013 STATUS			
CSO LTCP CAPITAL IMPROVEMENTS 1997-2007	2007 CSO REGULATOR STATUS	2007 EXISTING CONDITONS MODEL [1] 2-YEAR DESIGN STORM CSO VOLUME (MG)	REDUCTION 1997-2007 CSO VOLUME (MG)	NPDES PERMIT CSO REFERENCE NO.	PROPOSED NPDES PERMIT CSO REF. NO.	CSO LTCP CAPITAL IMPROVEMENTS & NOTES 2007-2013	2013 CSO REGULATOR STATUS
	Active			CSO 001	CSO 001		Active
Truman Tank	Closed	0.0	1.1	CSO 002			Closed
Truman Tank	Active	3.1	1.2	CSO 003	CSO 003		Active
	Active	6.1	0.0	CSO 004	CSO 004		Active
	Active	4.8	0.2	CSO 005	CSO 005		Active
	Active	Discharges to CSO 005 outfall		CSO 005 (A)			Closed
	Active	Discharges to CSO 005 outfall		CSO 005 (B)			Closed
	Active	5.1	-0.5	CSO 006	CSO 006		Active
	Closed	0.0	0.0	CSO 007			Closed
	Active	0.2	0.0	CSO 008		Scheduled for Closure	Close (2013)
	Active	2.5	0.3	CSO 009	CSO 009	I&I Project in Progress	Active
Sewer Separation	Active	0.3	0.4	CSO 010		Scheduled for Closure Sewer Separation in Progress	Close (2013)
	Active	0.6	0.1	CSO 010 (A)	R 010 (A)	Sewer Separation in Progress Discharges to CSO 011	Active
Sewer Separation	Active	7.4	2.5	CSO 011	CSO 011	Sewer Separation in Progress	Active
Sewer Separation	Active	1.5	1.2	CSO 012	CSO 012		Active
Sewer Separation	Active	0.1	0.7	CSO 013	CSO 013		Active
	Active	Discharges to CSO 013 outfall		CSO 013 (A)			Closed
	Active	1.0	-0.1	CSO 014	R 014	Scheduled for Closure Sewer Separation in Progress Discharges to CSO 011	Close (2013)
	Active	1.7	2.9	CSO 015	CSO 015	I&I Project in Progress; Tide Gate 2012	Active
	Active	3.8	-2.1	CSO 016	CSO 016	Tide Gate 2010	Active
	Closed	0.0	0.0	CSO 017			Closed
Sewer Separation	Closed	0.0	1.7	CSO 018			Closed
Sewer Separation	Active	1.3	0.2	CSO 019	CSO 019		Active
	Active	0.6	-0.4	CSO 020	CSO 020		Active
Sewer Separation	Active	5.0	0.4	CSO 021	CSO 021	Sewer Separation in Progress; Tide Gate 2013	Active
Sewer Separation	Closed	0.0	0.0	CSO 021 (A)			Closed
Sewer Separation	Closed	0.0		CSO 022			Closed
	Closed	0.0	0.0	CSO 023			Closed
Truman Tank	Active	0.6	2.9	CSO 024	CSO 024	Tide Gate 2010	Active
Sewer Separation	Active	2.5	1.7	CSO 025	CSO 025		Active
Sewer Separation	Active	Discharges to CSO 025 outfall		CSO 025 (A)			Closed
Sewer Separation	Closed	0.0	0.0	CSO 025 (B)			Closed
Sewer Separation	Active	0.0	0.1	CSO 026	R 026	Discharges to CSO 011	Active
	Active	0.5	0.2	CSO 027		Closed CSO	Closed
	Active	0.0	0.0	CSO 028	R 028	Discharge to CSO 012	Active
Pump Station Upgrade	Closed	0.0	0.3	CSO 029			Closed
Pump Station Upgrade	Closed	0.0	0.0	CSO 030			Closed
Sewer Separation	Active	0.9	No model data	CSO 031		Closed CSO	Closed
	Active	0.0	No model data	CSO 032	R 032	Scheduled for Closure	Close (2013)
	Active	0.0	No model data	CSO 033		Closed CSO	Closed
	Active	0.9	0.1	CSO 034	R 034	Discharge to CSO 025	Active
	Active	0.1	0.0	CSO 035		Closed CSO	Closed
	Active	0.0	No model data	(not assigned)	CSO GREENE		Active
	Closed	0.0	0.0	N/A			Closed
	Closed	0.0	0.0	N/A			Closed
		50.6	14.2				
		22%					
	33						21
	12						24
	28						17
	10						21

DEFINITIONS	
ACTIVE	ACTIVE CSO DURING A 2-YEAR STORM FREQUENCY, SEE NOTE NO. 3
INACTIVE	INACTIVE CSO DURING STORM FREQUENCIES BELOW 2-YEARS
CLOSED	CLOSED - BULKHEADED CSO, CLOSED FOR ALL STORMS

Fig. 13. *Note that CSO 031 was listed as 'Active' in 2007, and as 'Closed' in June, 2013.*

Due to the large volume of mixed sewage and stormwater that entered into the UARG on August 10, 2012, I sought verfication that the cross connection between the combined sanitary sewer system, and the separate stormwater system, was indeed closed (Fig. 14).

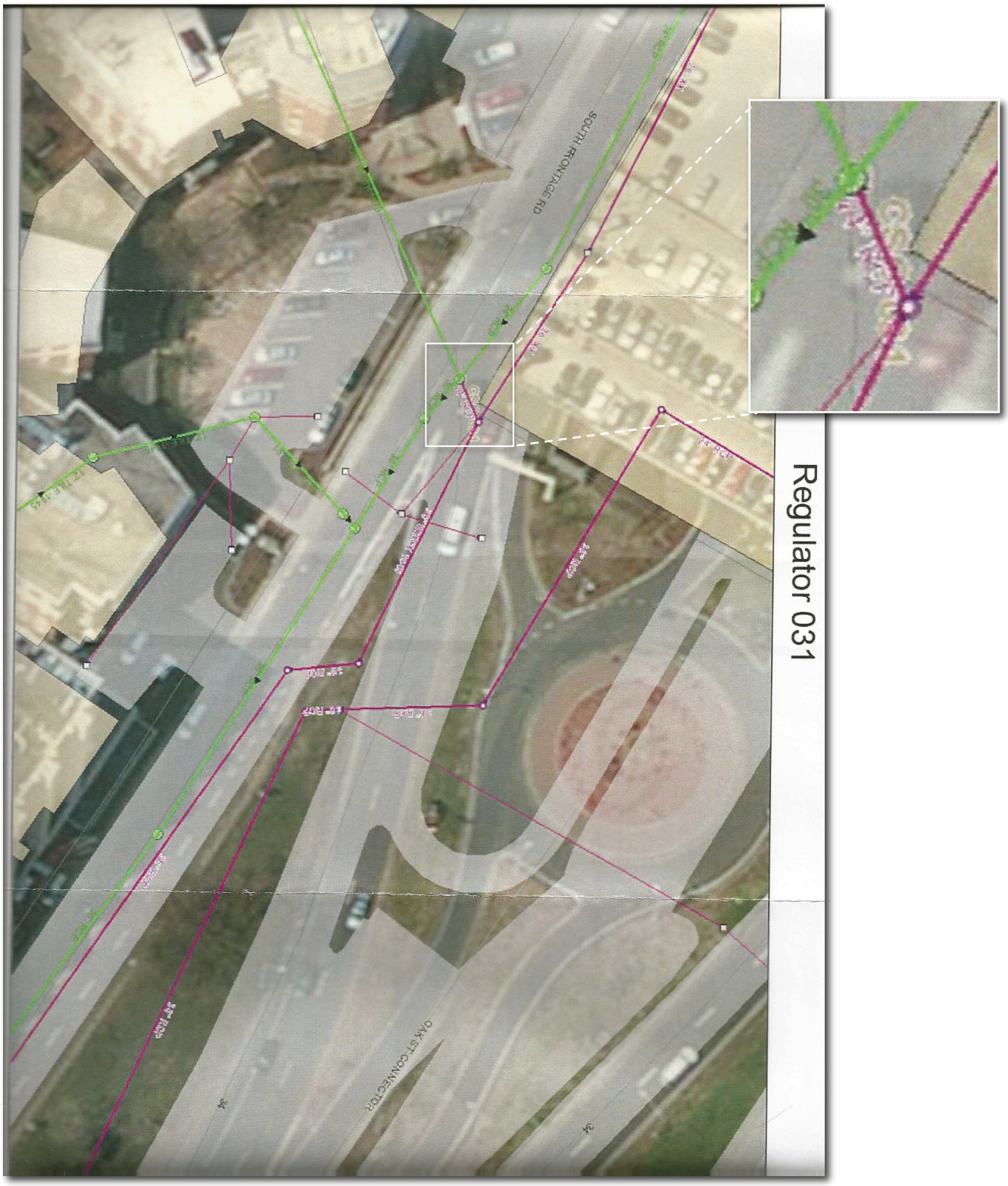


Fig. 14. *Close-up of CSO 031 and surrounding drainage infrastructure (provided by GNHWPCA in July 2013). Note the direction of flow within the sanitary system (green lines), which are part of the sewershed serving YNHH.*

On August 6, 2013, the GNHWPCA provided me with images that demonstrated the cross connection at CSO 031 was in fact open, and not closed, as had been reported to DEEP (Fig. 15 & 16).

Fig. 15. *CSO 031. The right sewer channel is looking straight into the separate storm sewer system that runs along the southern boundary of the ARG in Fig. 10 and in Fig. 14. The left sewer channel extends southwest to the other end of the CSO 031 that is shown in Fig. 16.*

Fig. 16*. CSO 031 - looking northeast toward the junction with the storm sewer system near the exit of the UARG.*

An open CSO cross connection at this location has significant implications, especially in light of the following conclusions from the Executive Summary of the Cardinal report (page v) :

"During storm events the rain water in the combined system exceeds the flow capacity and overflows located at State Street and Temple Street discharge into the storm sewer system. The storm sewer system also has limited capacity and frequent flooding occurs at Union Avenue, Route 34 and Temple Street."

The evidence presented in this letter indicates that the UARG should be added to this list of overflows. The overflow located at S. Frontage & Air Rights Garage (CSO / Regulator 031) likely behaves in the same manner as the overflows at Temple St. and at State St. when the capacity of the Route 34 corridor combined sewer system is exceeded. I believe that on August 10, 2012, CSO / Regulator 031 peformed as it was designed to, thereby conveying CSO to the separate storm water system that was also backed-up. With nowhere to go, the surcharged sewer system discharged sewage into the surrouding streets and into the UARG / YNHH loading dock area.

It appears that this noteworthy public health hazard was not reported by the NHPA to outside agencies with relevant jurisdiction and responsbility for discharges of untreated sewage into public spaces. For example, DEEP, which monitors CSOs within the state, was not informed of the possibilility that hospital sanitary waste had entered into a public space on August 10th, 2012. In addition, Roslyn Hamilton, the Senior Sanitatian within your department, reports that she was also unaware of the entry of untreated human sewage into the UARG or into the Temple St. Garage. In addition to the 2 to 3 feet of flood water that entered into the UARG on August 10th, the Cardinal report (page 5) decribes multiple instances of recent flooding in the Temple St. Garage, including one event that filled the lower level with 5 feet of water. This flood event required an enviromental cleaning company to be hired to remove the nearly one-million gallons of mixed stormwater and human sewage. It is alarming that the New Haven Fire Department, the New Haven Engineering Department, the GNHWPCA, DEEP, and the City of New Haven Health Department appear to

be unaware of these events because this lack of awareness has placed the public at risk, and continues to do so. It is alarming that the GNHWPCA would fail to field verify the actual funtional status of CSO 031 before documenting it as closed in an official statement to a state regulatory body, especially because it conveys hospital sanitary waste.

Furthermore, it is arguable whether DEEP is complying with the State of Connecticut, Public Act No. 12-11 – *An Act Conerning the Public's Right to Know of a Sewage Spill*. As specified in Section 1. 3 (b), DEEP should provide a map indicating which CSOs are anticipated to occur during certain storm events, their location, duration and extent, reasonable public health, safety or enviromental concerns and public safety precautions that should be taken. The only information currently available on the DEEP website regarding CSO 031 is its approximate location.

While the UARG is not the only public area in the Route 34 corridor that remains vulnerable to CSOs, it should be of particular concern to your department due to its close proximity to both YNHH / SCH, and to sewer infrastucture that was *engineered to discharge combined sewer overflows*. For CSO 031, these overflows likely include sanitary waste from the hospitals. It is not clear whether YNHH is aware that is is operating a loading dock with an access road, and egress, that has been inundated with untreated sewage, or that their service area remains at risk from future CSOs. I allege that on at least one occasion, August 10, 2012, the YNHH loading dock continued to operate in the immediate aftermath of the flood, with delivery vehicles moving through pools of water containing untreated human waste from its own hospitals (see Fig. 3).

As you are probably aware, the100 College Street Development located just east of the ARG has broken ground. Its effects on the hospital district's sewershed are presently unclear. While excavation at the site may offer a window of opportunity for cost effective remediation of the hospital district's CSO problem, it is unclear if the true extent of the problem is properly understood by the developers and by the city agencies that are responsible for protecting the public. For example, a review of the site plans prepared by Fuss & O'Neill for drainage around 100 College Street do not include CSO 031 (Fig. 17). This may be an oversight that is based upon inaccurate reporting of the functional state of CSO 031 by the GNHWPCA.

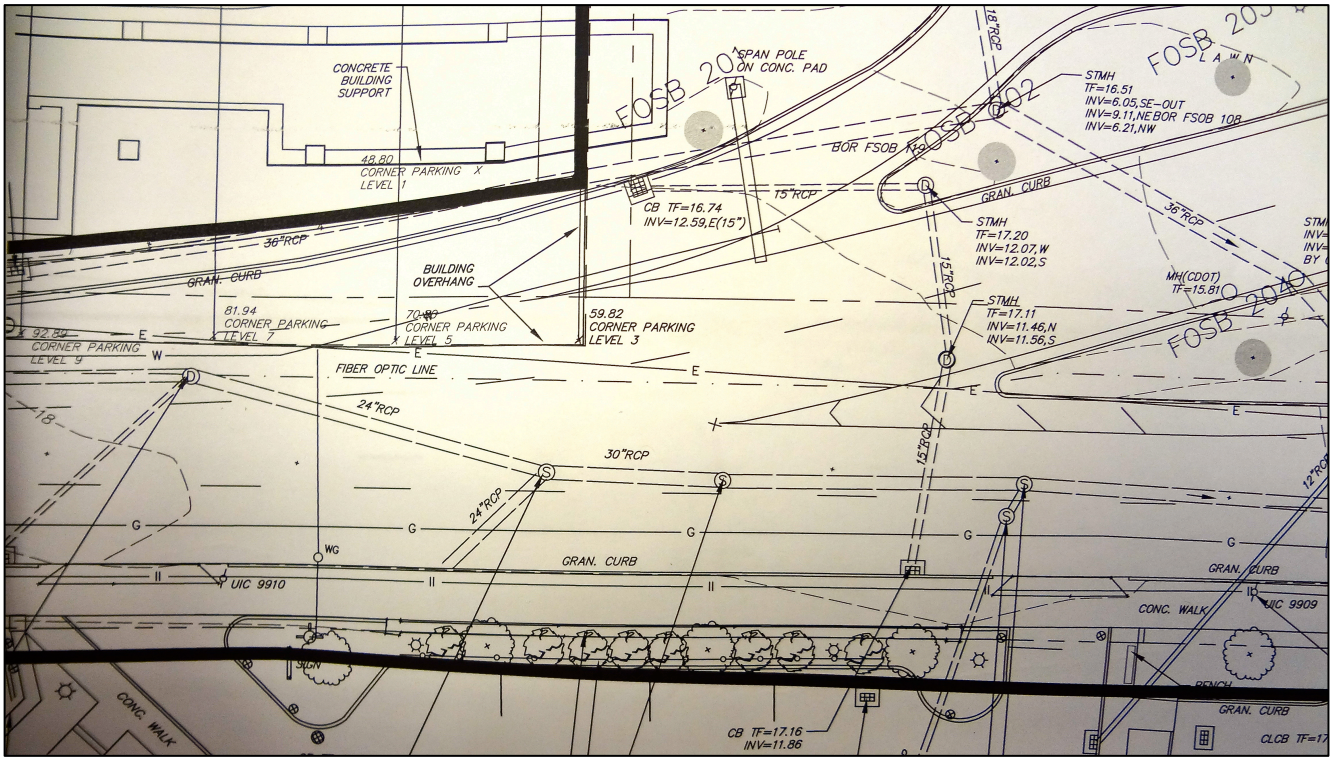


Fig. 17. *A section of the 100 College Street – Existing Conditions Plan prepared by Fuss & O'Neill. Drawing Number EXC-101.*

In addition, one drainage improvement identified in the site plan, a stormtrap detention system adjacent to the UARG (Fig. 18) is likely to be inadquate to prevent localized flooding during events that result in widespread flooding and CSOs within the corridor. The trap has a specified capacity of 2,500 cubic feet (18,000 gallons). Please recall that at least on one occasion, nearly 1,000,000 gallons (133,000 cubic feet) of flood water needed to be removed from the Temple St. Garage.

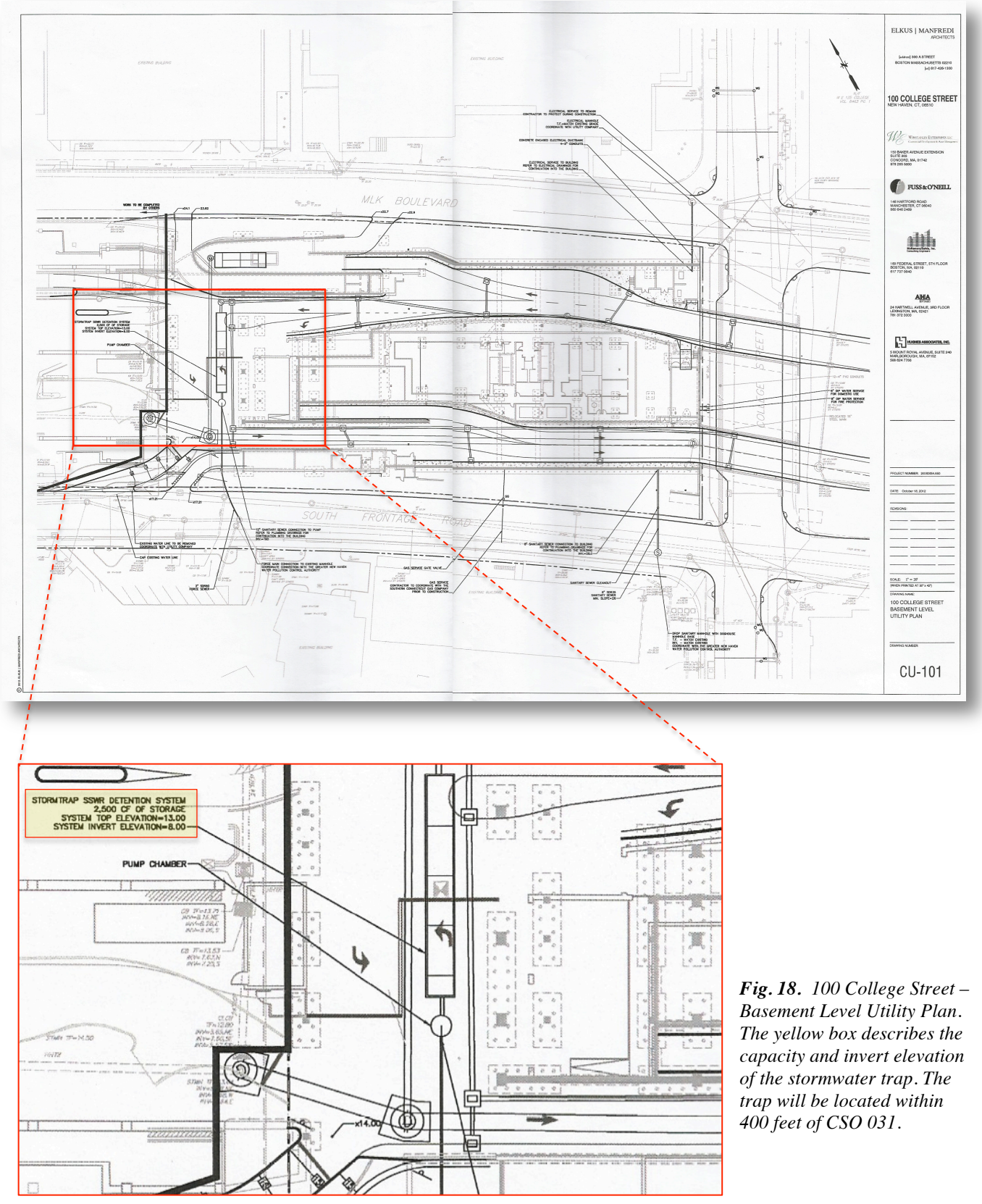


Fig. 18. *100 College Street – Basement Level Utility Plan. The yellow box describes the capacity and invert elevation of the stormwater trap. The trap will be located within 400 feet of CSO 031.*

In summary, the sewer system serving the hospital district is clearly inadequate. Development in the region has increased surface runoff, as well as flow into the sanitary system, but these changes have not been accompanied by commensurate improvements in drainage capacity. Because the City of New Haven has not implemented effective solutions, combined sewer overflows containing untreated human sewage will continue to flow into public buildings and onto roadways. A succinct summary of the problem is provided in the Executive Summary of the Cardinal report (page vi):

" *The flooding in the downtown areas is caused by a combination of 3 factors:*

- *an inadequate storm sewer system,*
- *backups in the storm sewer system due to tidal fluctuations in the Long Island Sound,*
- *inadequate combined sewer system.*

Improvements will be required for both the storm sewer system and the combined sewer system to mitigate flooding in these three problem areas"

It is unclear what, if any, measures have been taken to mitigate the risk to public health from future CSOs into public spaces within the ill-conceived and grossly mismanaged Route 34 Corridor.

Please contact me with any questions regarding this matter.

Sincerely,

Gerald Valentine, M.D.
Hamden, CT